

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference SAP-5776-WO	FOR FURTHER ACTION		See item 4 below
International application No. PCT/EP2004/014362	International filing date (<i>day/month/year</i>) 16 December 2004 (16.12.2004)	Priority date (<i>day/month/year</i>) 19 December 2003 (19.12.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant LEICA GEOSYSTEMS AG			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Date of issuance of this report 29 August 2006 (29.08.2006)
	Authorized officer Agnes Wittmann-Regis e-mail: pt06@wipo.int

PATENT COOPERATION TREATY

TRANSLATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

Date of mailing (day/month/year)	See form PCT/ISA/210
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Applicant's or agent's file reference SAP-5776-WO	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/EP2004/014362	International filing date (day/month/year) 16.12.2004	Priority date (day/month/year) 19.12.2003
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International Patent Classification (IPC) or both national classification and IPC G01S7/481, G01S7/486
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Applicant LEICA GEOSYSTEMS AG

1. This opinion contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP	Authorized officer
Facsimile No.	Telephone No.

WRITTEN OPINION OF THE
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Box No. I

Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-15</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>2, 4, 6, 8, 10, 12, 13</u>	YES
	Claims	<u>1, 3, 5, 7, 9, 11, 14, 15</u>	NO
Industrial applicability (IA)	Claims	<u>1-15</u>	YES
	Claims	_____	NO

2. Citations and explanations:

1 Reference is made to the following documents:

D1: DE 101 25 484 A (ASAHI OPTICAL CO LTD) 21
March 2002 (2002-03-21)

D2: EP 0 448 111 A (PERCEPTRON INC) 25 September
1991 (1991-09-25)

D3: WO 01/29576 A (PSC SCANNING INC) 26 April 2001
(2001-04-26)

D4: EP 0 768 542 A (TOPCON CORP) 16 April 1997
(1997-04-16)

D5: WO 03/002939 A (BOSCH GMBH ROBERT; SCHMIDT,
DIERK (DE); STIERLE JOERG (DE); WOLF PETER) 9
January 2003 (2003-01-09)

D6: DE 198 40 049 A (LEICA GEOSYSTEMS AG) 6 April
2000 (2000-04-06)

D7: EP 0 635 729 A (NIPPON DENSO CO) 25 January
1995 (1995-01-25)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the
requirements of PCT Article 33(1) because the
subject matter of claim 1 does not involve an
inventive step within the meaning of PCT Article

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33(3).

2.1.1 Document D1 is considered the prior art closest to the subject matter of claim 1. It discloses (see D1: abstract, paragraph 4, 74-79):

An apparatus for measuring the distance to remote and nearby objects reflecting laser beams emitted and modulated by the apparatus, with

- a common objective for emitting the laser beams and for collecting beams comprising laser beams reflected by the objects and background beams,
- means for selecting beams of an associated cross-sectional region of a bundle of collected beams, which region has a first and at least one second section, the first section being assigned laser beams reflected by a remote object and the at least one second section being assigned laser beams reflected by a nearby object and only a fraction of the collected laser beams reflected by the nearby object being selected across the second section and
- a receiver for converting selected beams into a single electric signal by means of which the distance can be determined using the propagation speed of optical beams.

2.1.2 The subject matter of claim 1 therefore differs from what is known from D1 in that
the means are designed such that the at least one second section has at least the extent of

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
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the first section.

2.1.3 The problem addressed by the present invention can therefore be considered that

sufficient reflected transmitted beams are converted for conveniently measuring to the nearby object.

2.1.4 The solution proposed in claim 1 of the present application cannot be considered inventive for the following reasons (PCT Article 33(3)):

Document D2 discloses (see D2, figure 7 and column 6, line 28 - column 7, line 6) that the section for a nearby object is larger than for a remote object in order to thereby achieve a good signal/noise ratio for both remote and nearby objects.

2.1.5 A person skilled in the art would therefore combine all the features disclosed in D1 and D2 in order to solve the problem of interest, without thereby being inventive. The solution proposed in independent claim 1 cannot therefore be considered inventive (PCT Article 33(3)).

3 INDEPENDENT CLAIM 4

3.1 Document D1 is considered the prior art closest to the subject matter of claim 4. It discloses (see D1: abstract, paragraph 4, 74-79):

An apparatus for measuring the distance to remote and nearby objects reflecting laser

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citations and explanations supporting such statement

beams emitted and modulated by the apparatus,
with

- an objective for emitting the laser beams and for collecting beams comprising laser beams reflected by the objects and background beams,
- means for selecting beams of an associated cross-sectional region of a bundle of collected beams, which region has a first and a second section, the first section being assigned laser beams reflected by a remote object and the second section being assigned laser beams reflected by a nearby object and only a fraction of the collected laser beams reflected by the nearby object being selected across the at least one second section and
- a receiver for converting selected beams into a single electric signal by means of which the distance can be determined using the propagation speed of optical beams.

3.2 The subject matter of claim 4 therefore differs
from the known apparatus in that

the distance to specular reflective objects is
measured by means of laser beams emitted by a
further objective as a decollimated beam
bundle and in that

the means are designed such that the second
section has at least the extent of the first
section.

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3.3 The subject matter of claim 4 is therefore novel
(PCT Article 33(2)).

3.4 The problem addressed by the present invention can
therefore be considered that of
 permitting convenient measurement of the
 distance to remote and nearby specular
 reflective objects, wherein sufficient
 reflected transmitted beams are converted for
 measuring to the nearby object.

3.5 The solution to this problem proposed in claim 4
of the present application involves an inventive
step for the following reasons (PCT Article
33(3)):

 The combination of features used in claim 4 is
 not known from the prior art nor would it be
 regarded as a routine approach by a person
 skilled in the art.

4 DEPENDENT CLAIMS 3, 5, 7, 9, 11, 14, 15
Claims 3, 5, 7, 9, 11, 14, 15 do not contain any
features which, in combination with the features
of any claim to which they refer, meet the PCT
requirements for novelty and inventive step. See
also the paragraphs of documents D1 to D7 cited in
the international search report.

5 DEPENDENT CLAIMS 2, 6, 8, 10, 12, 13
The combination of features contained in dependent
claims 2, 6 and 8 is neither known from the
available prior art, nor is it suggested by it.

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The reasons are as follows:

Claims 2, 6 and 8 relate to specular reflective objects and are novel and inventive for the same reasons as claim 4 as described in paragraph 3 above.

Claims 10, 12 and 13 relate to specific embodiments of the "means for selecting" which are not readily known or do not readily result from the prior art.